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ABSTRACT

The Response to Educational Needs Project (RENP) is a federally supported compensatory education program. In this paper the following questions are addressed: (1) Is the Response to Educational Needs Project (RENP) worth Federal support? (2) Would the Federal government be better able to achieve similar educational objectives by supporting other programs? (3) Can local education agencies use their Title I dollars in ways that are more effective than supporting RENP? RENP is described and other programs are compared with it. Basic assumptions underlying a cost effectiveness analysis are discussed and data are presented. Conclusions are drawn about the effectiveness of educational strategies in programs with different cost structures. (Author/MC)

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UR-329

RENP COST EFFECTIVE IN MIDDLE AND LATE ELEMENTARY GRADES

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GENERAL PROBLEM

This is the third in a series of short papers about the cost of the Response to Educational Needs Project. The first paper (Rogers, 1977c) concluded that wide scale replication of RENP required federal support because local education agencies (LEAs) can not afford to pay for the program with state and local funds. The second paper (Rogers, 1977b) concluded that RENP is neither too expensive for direct federal support nor too expensive for an LEA to support with funds provided under Title I of the Elementary and Secondary Education Act (Title I, ESEA). These conclusions raise another problem. Is RENP worth the support? Would the federal government be better able to achieve similar educational objectives by supporting other programs? Can LEA's use their ESEA, Title I dollars in ways that are more effective than supporting RENP? The purpose of this paper is to address these questions.

The remainder of this paper will be divided into four major sections. The first will present a description of RENP. The second will discuss programs that will be compared with RENP. The third will discuss basic assumptions underlying a cost effectiveness analysis. And, finally, the fourth will present cost and effectiveness data and conslusions that may be drawn from this data.

DESCRIPTION OF RENP

The Response to Educational Needs Project (RENP) represents an effort on the part of the Anocostia community of the District of Columbia to

attack the reading problem at a community level. RENP, which is funded by the National Institute of Education, operates in grades 4 through 6 within 10 elementary schools and in grade 8 in one junior high school in Anocostia. Although RENP emphasizes training teachers to meet the needs of the educationally disadvantaged, it also attempts to attack the reading problem on several fronts simultaneously including the classroom, the community, the home, and within specially designed reading laboratories. Salient dimensions of the RENP approach include:

- The use of Program Facilitators, similar to "Master Teachers" who are permanently based in a given school to provide training to all teachers in grades 4, 5, and 6 on a regular basis.
- Attempts to meet the individual needs of each client-teacher by diagnosing particular areas of strengths and weakness of each teacher through the administration of a comprehensive needs assessment and continued monitoring of each teacher's progress.
- The use of aides to work with individual students on specific reading skills, and who are capable of "taking over" the classroom, when teachers are receiving training.
- Specialized training which is integrated into the normal work day and is not defined as "extra duty."
- While the training programs for teachers are individualized, all teachers are trained in the use of the "diagnostic-prescriptive approach" to the teaching of reading so they may better meet the individual needs of their students.
- The use of reading laboratories within each school to which students are sent on a regular basis to work on specific reading skills.
- The use of community organizers who work with parents and the community at large, providing information about the program and helping parents to better understand how they can help their children's reading progress.
- The use of existing school curricula to improve reading skills. RENP does not stress "gimmicks" or special material. It seeks to help teachers better use material which is readily available to them.

COMPARISON PROGRAMS

One major purpose of this paper is to compare the cost and effectiveness of RENP with the cost and effectiveness of other federally funded

programs. Unfortunately, the number of comparisons that can be made is severly constrained by the availability of reasonably accurate cost and effectiveness data. If strict criteria are applied, no comparisons can be made. However, by making a few liberal assumptions enough comparisons can be made to answer the questions addressed by this paper. This section will briefly describe programs to be compared with RENP, and the next section will discuss the assumptions underlying the comparisons.

The most current program data to be compared with RENP comes from the Instructional Dimensions Study (Brady, Clinton and Sweeney, 1977). This study was conducted during the 1976-77 school year and was a field study of the impacts of instructional practices and teacher characteristics on student achievement and attitudes toward reading and mathematics at the first and third grade levels. The reported average effectiveness and costs for third grade students in Title I supported reading and mathematics programs will be used. These data are averages from 14 different programs in 14 LEAs. Although the reported data do not represent a specific program, the data will be used to provide a general indication of the cost and effectiveness of Title I programs.

The next set of data to be used is from the analyses of the cost and effectiveness of Follow Through projects. (Rogers, et al, 1977 and Stebbins, et al, 1977). The cost data was collected during the 1975-76 school year. The effectiveness data was collected during Spring, 1975 and is the final set of data for a longitudinal evaluation begun in the 1960s. Effectiveness data for 15 different Follow Through models will be presented. Each model focuses on children in kindergarten through third grade and has its own, different approach for educating these children.

The next set of data comes from Research on the Effectiveness of Compensatory Education Programs (Bernstein and Pelavin, 1977). This study reports effectiveness data on four exemplary programs. Effectiveness data for three programs are in a format comparable to RENP data and will be used in this paper. Unfortunately comparable cost data is not available. However, the program descriptions lead to the assumption these programs cost about the same as RENP.

The final set of data come from a study of compensatory reading programs in 266 schools conducted during the 1972-73 school year for the

Office of Education by the Educational Testing Service and RMC Research. (Trismen, Waller and Wilder, 1976 and Dienemann, Flynn and Al-Salam, 1974). This paper presents the average effectiveness of three, Title I programs that were considered to be "unusually effective" at the fourth grade level. In other words, these were found to be the most effective programs. The costs of these programs were not collected in a manner that allows them to be compared with RENP. However, the scope of the program and the available cost data indicate costs of these programs are similar to the cost of RENP.

COST EFFECTIVENESS COMPARISONS

A recent study (Rogers, 1977a) established five criteria that should be met before a cost-effectiveness analysis is conducted. None of the data sets to be presented clearly meet these criteria. All appear to fail one or more of the five criteria to some degree. Therefore, a few assumptions are required before any comparisons can be made. These will be discussed below.

The first criteria is that a cost-effectiveness analysis requires that two or more alternatives designed to achieve the same objectives are compared. For the purposes of this paper, the various programs will be assumed to be alternatives designed to achieve the same objectives. This is a reasonable assumption because all programs attempt to increase students' mathematical and reading ability.

The second criteria is that only the cost of resources used to implement the program are included in the analyses. The third criteria is that the analysis uses costs of implementing each alternative in the environment where it will be implemented or, when appropriate, in a standard environment. Basically, these two criteria require that the cost estimates used in the cost-effectiveness analysis are reasonable estimates of the actual cost of using a program where it will be used. The available cost data do not meet this criteria. The available data generally specify an actual cost at a single place at a precise period in time. The cost of using the same program at a different, single, specific place at a different time is unknown and can not be estimated with much precision. However, the data does allow average cost of using a program in a large number of different LEAS to be accurately estimated. Furthermore, because

of the observed variance in average costs in the available data, these average costs are likely to be quite similar. Therefore, for the purposes of this paper, the average cost of implementing any program in 100 LEAs will be assumed to be equal to the average cost of implementing any of the other programs in 100 LEAs.

Table 1 presents the average adjusted cost per student for a number of different compensatory education programs. The cost of reading and mathematics programs range from $2,699 to $1,828. If the previous assumption is valid, then the $871 difference is attributable to sampling and measurement error caused by factors such as biased site selection, failure to measure all costs, and failure to properly adjust costs for inflation. This is a reasonable assumption because the data were collected in different time periods with different procedures.

The fourth cost-effectiveness criteria is that the results caused by using each alternative is either known or can be predicted. For the purpose of this paper, the reported effects of a program will be assumed to be caused by the program. Furthermore, the average effects of implementing the program in a large number of LEAs will be assumed to not differ significantly from the reported effects. This appears to be a reasonable assumption for all programs except those in the Study of Compensatory Reading Programs. The information necessary to judge the validity of this assumption for these programs was not reported.

The final criteria is that the effectiveness measures are valid, reliable, and at least interval level data. The effectiveness measures presented in this paper are percentile ranks on standardized tests. These will be assumed to be valid measures of the degree of achievement of a program's objectives. This is a reasonable assumption for all programs except Follow Through models. Some Follow Through model's objectives are not measured by test scores. However, these are the only common measures for all programs. Therefore, the assumption will be made to allow comparisons but the weakness of the assumption must constrain any conclusions.

COMPARISONS AND CONCLUSIONS

Table 2 presents average percentile[1] ranks for RENP students on the

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1. Percentile ranks are based on national norms.

Table 1

PROGRAM AVERAGE COST PER STUDENT

Program	Adjusted Average Cost per Student
Culturally Democratic Learning Environment Model[a]	$2,699
Learning Systems Corp. Early Childhood Model[a]	2,441
Bank Street Model[a]	1,954
RENP (reading and mathematics)	1,936
Role Trade Model	1,918
Instructional Dimensions (reading and mathematics)	1,915
Michigan Study (reading and mathematics)[b]	1,828
RENP (reading only)	1,640
Instructional Dimensions (reading only)	1,611
Instructional Dimensions (mathematics only)	1,588
RENP (mathematics only)	1,580
Michigan Study (reading only)	1,580
Michigan Study (mathematics only)[b]	$1,530

a. Follow Through models.

b. Estimated by assuming mathematics costs are 83 percent of reading costs.

Table 2

AVERAGE PERCENTILE RANKS FOR RENP STUDENTS
ON SUB-TESTS OF THE CTBS

Subtest	Grade	Average Percentile Rank		
		Pretest	Post test	Change
Vocabulary	4	30	26	-4
	5	29	34	5
	6	29	27	-2
	8	29	24	-5
Comprehensive	4	30	33	3
	5	27	51	14
	6	29	34	5
	8	29	28	-1
Math Concepts	4	27	39	12
	5	29	36	7
	6	26	46	20
	8	29	42	13
Math Computation	4	25	33	8
	5	30	45	15
	6	29	40	11
	8	32	28	-4
Math Application	4	27	26	-1
	5	29	38	9
	6	29	40	11
	8	28	29	-1

California Test of Basic Skills.[1] The pre and post tests were administered during the Fall and Spring of the same school year. Even the most superficial analysis of the pretest scores indicates a high degree of consistancy across subtests and grades. Ten of the 20 scores are the 29th percentile. This strongly suggests that the gains or losses occuring between Fall and Spring disappear over the summer, and the average RENP student stays right at the 29th percentile. A separate study is being conducted to test this hypothesis. Therefore, this conclusion must be considered tentative.

Table 3 reports similar percentiles for students in the comparison programs. The programs are Study of Compensatory Reading Programs (SCRP), the Instructional Dimensions Study (ID), the Alum Rock Reading (AR)[2] Program, and the California State Demonstration Reading (CSDR)[2] and Mathematics (CSDM)[2] Programs. The pre and post test results are from the Fall and Spring administration of either the California Test of Basic Skills (CTBS) or the Metropolitan Achievement Test (MAT) and are either total reading or total mathematics scores.

One of the purposes of the Research on the Effectiveness of Compensatory Education Programs was to see if gains occuring during the school year were lost during the summer. The study found that this occurred for all the programs that were analysed. Therefore, just as the reported gains and losses for RENP were discounted, the reported gains for SCRP, ID, and AR may also be discounted. This is particularly true for AR because fourth grade scores are lower than third grade scores. CSDR and CSDM, however, show real gains that are maintained over the summer months.

Table 4 presents the names and the abbrevations for Follow Through models. The percentile ranks for students experiencing these models are presented in Tables 5 and 6. Table 5 presents median percentile for total reading on the MAT administered at the end (Spring, 1975) of the third grade. Table 6 presents the mathematics scores. These scores are from a special population of Follow Through students. All students' schools experiences were in a Follow Through classroom, and all participated in

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1. Data supplied by Richard A. Gibboney Associates, Inc. Total reading and total mathematics scores where not available when this paper was written.

2. The effects of these programs are reported in Research on the Effectiveness of Compensatory Education Programs.

Table 3

PERCENTILE RANK FOR COMPARISON
STUDENTS ON TOTAL READING

Program	Type	Test	Grade	Average Percentile Rank		
				Pretest	Post test	Change
SCRP	Reading	MAT	4	17	27	10
ID	Reading	CTBS	3	16	27	11
AR	Reading	CTBS	3	28	36	8
AR	Reading	CTBS	4	22	24	2
CSDR	Reading	CTBS	7	12	20	8
CSDR	Reading	CTBS	8	16	23	7
ID	Math	CTBS	3	7	17	10
CSDM	Math	CTBS	7	23	45	22
CSDM	Math	CTBS	8	26	38	12

Table 4

FOLLOW THROUGH MODELS

Full Model Name	Name Used in Report	Sponsoring Institution or Agency
Bank Street College of Education Approach	Bank Street	Bank Street College of Education
Behavior Analysis Approach	BA	Support and Development Center for Follow Through - University of Kansas
California Process Model	Cal Process	California State Department of Education - Division of Compensatory Education
Cognitively Oriented Curriculum Model	Cognitive Curriculum	High/Scope Educational Research Foundation
Cultural Linguistic Approach	CLA	Northeastern Illinois State College
Direct Instruction Model	Direct Instruction	University of Oregon - College of Education
EDC Open Education Follow Through Program	EDC	Education Development Center
Florida Parent Education Model	Parent Education	University of Florida
Home-School Partnership Model	Home-School Partnership	Clark College
Individualized Early Learning Program	IELP	University of Pittsburgh - Learning Research and Development Center
Interdependant Learning Model	ILM	City University of New York - Institute for Developmental Studies
Language Development (Bilingual) Education Approach	SEDL	Southwest Educational Development Laboratory
Mathemagenic Activities Program	MAP	University of Georgia
The New School Approach to Follow Through	NSA	University of North Dakota
Responsive Education Model	Responsive Education	Far West Laboratory for Educational Research and Development
Tucson Early Education Model	TEEM	Arizona Center for Early Childhood Education

Table 5

MEDIAN PERCENTILE RANK FOR TOTAL READING FOR THIRD GRADE FOLLOW THROUGH STUDENTS WITH HEAD START EXPERIENCE

Follow Through Model	Percentile Rank
NSA	48
IELP	46
Direct Instruction	42
Bank Street	38
BA	34
Home School Partnership	34
Parent Education	32
TEEM	31
CLA	29
EDC	28
Responsive Education	27
ILM	23
Cognitive Curriculum	22
SEDL	19
Cal Process Model	17

Table 6

MEDIAN PERCENTILE RANK FOR TOTAL MATHEMATICS FOR THIRD GRADE FOLLOW THROUGH STUDENTS WITH HEAD START EXPERIENCE

Follow Through Model	Percentile Rank
Direct Instruction	48
Home-School Partnership	34
IELP	30
NSA	30
TEEM	30
BA	29
CLA	24
EDC	24
Bank Street	22
Responsive Education	20
Parent Education	19
SEDL	18
ILM	16
Cal Process	15
Cognitive Curriculum	14

in a Head Start preschool program. Follow Through models are designed to serve these students and are most effective with them.

Test scores for these Follow Through students for the beginning of the fourth grade are not available. Therefore, the gain or loss occurring over the summer can not be estimated. However, if these Follow Through students experience a summer loss equal to the loss in other programs, then the students in the most effective Follow Through programs are still performing at levels higher than students in the other programs on reading tests and about the same on mathematics tests.

Before drawing any conclusions from the data, consideration of the students served by the various programs appears warranted. Theoretically all the programs serve similar students. All come from low income families, and the vast majority are eligible to particapate in Title I programs. However, the standardized test data indicate real and meaningful differences in the performance of the students served by the various programs. RENP students appear to enter the RENP program at the 29th percentile. This is probably about the same level that many Follow Through students leave the most successful models. Students in other programs appear to enter and exit with fewer skills. Therefore, it is hard to predict how well RENP or Follow Through students would perform in these programs.

This paper began by asking questions about the cost effectiveness of the various programs. These answers to these questions must be carefully qualified. The conclusions to be drawn rest on the assumptions presented in the previous section. The following conclusions are only as tenable as these assumptions.

The most effective Follow Through programs are clearly the most cost effective programs for kindergarten through the third grade.

The most cost effective programs for the fourth through eighth grade depends upon the students' skills. If students are performing well, then using RENP to maintain their performance is the best strategy. If the students are performing poorly, then CSDR and CSDM should be used to increase performance. Nothing in the data indicates either that RENP will improve the performance of students with relatively poor skills or that CSDR and CSDM will improve the performance of students with relatively good skills.

The effective Follow Through models, RENP, CSDR and CSDM are more cost effective than the other Title I, ESEA, programs reviewed in this paper.

The best overall strategy appears to be to use a Head Start-Follow Through-RENP sequence. This, however, is a short term solution. In the long term, a program that not only maintains but increases student achievment should replace RENP. However, until such a program is identified, using RENP to maintain student performance is the most desireable alternative.

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